Industrial Discretization Mechanism and Agglomeration Countermeasures for Industrial Parks

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Abstract With rapid development of industrial parks in China, it lacks strict control in planning for establishment and land use of industrial parks. The supply is seriously surplus, and cut-throat competition takes place in investment inviting activities, leading to discretized development of industries in industrial parks. Industrial park and enterprise cluster have a common foundation, namely, geographic concentration of industries. Industrial parks with enterprise cluster development show various advantages, so industrial parks should take industrial cluster development as their ultimate direction. From problems in construction of industrial parks, this paper analyzes mechanism of discretized industrial parks, and accordingly puts forward countermeasures for promoting cluster development; (1) Scientifically distributing administrative power of local government, improving supervision and assessment mechanism, and guaranteeing reasonable supply of industrial parks from system; (2) Introducing market-oriented industrial park construction mechanism, to promote market-oriented supply of industrial parks; (3) Strengthening construction of administrative ethics and abilities of local government, to promote coordinated and healthy development of industrial parks; (4) Forming excellent enterprise cluster development expectation and strengthening cluster-based decisions of enterprises entering industrial parks.

Key words Enterprise cluster, Industrial parks, Industrial discretization, Agglomeration countermeasures

A lot of theoretical researches and practical experience have proved that enterprise cluster, as an important economic development form, has many economic features and plays a great role in raising industrial competitiveness of a certain region. The agglomerative economic effect generated from enterprise cluster not only reduces production cost for enterprises in the cluster, but also benefits achievement of innovation and sustainable competitive edge. Industrial park and enterprise cluster have a common foundation, namely, geographic concentration of industries. Successful industrial parks both at home and abroad take on distinctive feature of enterprise cluster, such as Silicon Valley in USA, Bangalore cluster in India, Zhongguancun Science and Technology Park in China, and Hsinchu Science Park in Taiwan[1]. However, industrial park is not equivalent to enterprise cluster, and geographic concentration of enterprises does not necessarily produce agglomeration effect. Industrial parks based on enterprise clusters have more advantages and more powerful competitiveness, and have greater contribution to regional economy. On the contrary, spatial agglomeration of enterprises of many irrelevant industries features that it is difficult for discretized industrial park to reflect economic nature of enterprise cluster. As an effective organization coordinating enterprises, enterprise cluster is an inevitable choice for promoting development of industrial parks.

1 Existing problems in development of industrial parks

In China, the construction of industrial parks started from Shekou Industrial Park built from the end of 1978. In the early 1984, in order to further expand opening-up, the State Council decided to set up economic and technological development zones in coastal cities with reference to successful experience of special economic zones. Later, especially after South Tour Speeches of Deng Xiaoping in 1992, industrial parks sprang up in all areas of China, which greatly promotes development of local economy. However, with rapid development of industrial parks, other conflicts and problems also appear.

1.1 Strict control in planning for establishment and land use of industrial parks and strict surplus of supply Since the 1990s, China experienced three times of development peaks of industrial parks, and the State Council rectified problems of industrial parks for three consecutive times. Among rectified industrial parks, most are built by government sectors at city, county and township levels in violation of regulations, and their establishment and land use lack control in planning. Hot construction of industrial parks leads to serious supply surplus, which can be shown in Table 1 and Table 2. However, with the third time rectification work coming to an end, some places started construction of development zones without authorization in the name of "ecological park", "travel resort", "industrial base" and "industrial corridor", or expanded area of development zones, and a new round of development hot springs up quietly[2].

1.2 Similar industrial structures in different industrial parks and imperfect development coordinating mechanism The development of industrial parks is out of balance, functions of various industrial parks are similar, and mechanism for coordinating development is not perfect. Industries in industrial parks mainly are concentrated in electronic information, biological information, new material, and optical, mechanical and electronic integration, leading to similar industrial investment and structure. For example, related departments have made statistics of 3 990
kinds of products in national new and high technological development zones, and among them 1 288 kinds (32.3%) are micro-electronic and electronic information technology products [3].

Table 1 Situati of the first and second time development hot of development zones

<table>
<thead>
<tr>
<th>Development times</th>
<th>Number of development zones</th>
<th>Planning area $10^3 km^2$</th>
<th>Building area $10^3 km^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1951</td>
<td>1.53</td>
<td>307</td>
</tr>
<tr>
<td>2</td>
<td>4210</td>
<td>1.24</td>
<td>2322.5</td>
</tr>
</tbody>
</table>


Table 2 Situation of development zones before and after the rectification of third time development hot

<table>
<thead>
<tr>
<th>Number of development zones before rectification</th>
<th>Number of development zones after rectification</th>
<th>Area before rectification $10^3 km^2$</th>
<th>Area after rectification $10^3 km^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>6806</td>
<td>1568</td>
<td>3.86</td>
<td>9949</td>
</tr>
</tbody>
</table>


1.3 Cut-throat competition in investment inviting activities in industrial parks Investment inviting is the major task of various industrial parks, while seriously surplus supply of industrial parks leads to cut-throat competition in investment inviting activities. Although most industrial parks have formulated their industrial development plans, government at all levels takes investment inviting as top priority under the high pressure of developing local economy and realizing rapid growth of GDP. In actual operation, investment inviting even becomes an administrative task that must be accomplished by competent authorities, then it is difficult to implement development plan of industrial parks.

1.4 Serious discretization of industries in industrial parks and failure to reflect characteristics of industries Due to lack of conscious guidance on enterprise cluster, development of industrial parks remains at the extensive expansion development stage. Industrial parks in many places only care about increase in quantity, but fail to lay stress on cultivating sustainable competitiveness of enterprises and regional characteristic industries. Enterprises in industrial parks lack industrial connection and fail to form excellent labor division and coordination, leading to high cost for production and transaction of enterprises, low market competitive edge of products, and limited innovation of enterprises.

2 Industrial discretization mechanism of industrial parks Objectively, industrial park can be taken as a kind of product provided by government. Enterprise is consumer of such product. When supply of product is larger than demand, the producer has to reduce product price. Therefore, from the perspective of supply and demand, the cause of industrial discretization can be ascribed to surplus supply of quantity of industrial parks, and insufficient demand of enterprises is also a direct cause for this problem.

In fact, superior government hopes to establish industrial parks that have certain quantity and scale. According to the Growth Pole Theory, central government or provincial government, as superior government, has to put resources into some areas in accordance with economic development realities and efficiency, to make them become growth pole in national economy, and accordingly drive development of other areas. Therefore, superior government should build industrial infrastructure in partial space for developing economy from resource allocation efficiency based on overall arrangement of time and space of benefit, then industrial park as carrier for promoting regional economic development naturally becomes an inevitable choice. Nevertheless, development of industrial parks not only needs economic and social environment suitable for related industries, such as commercial atmosphere, market, talents, technology, and supply of raw materials, but also needs certain scale to bring into play its advantages of scale. Limited by resources and regional conditions, superior government has requirements for quantity and scale of industrial parks. However, in the process of development of industrial parks, local government, in disregard of requirements of superior government, sets up industrial parks in large number and expands the scale. As a result, supply of industrial parks is seriously surplus, and consequently leading to discretized development of industrial parks.

2.1 Term of office based assessment and "election coercion effect" leading to surplus supply of industrial parks In accordance with the Principal – agent Theory, power distribution between superior and inferior government is a principal – agent action, which is realized mainly through administrative authorization of superior administrative subjects to inferior ones. Administrative authorization not only reduces burden of superior subjects and makes them have time to handle major issues, but also raises enthusiasm of inferior administrative organs, brings their special skills into full play, and plays a great role in stimulating and promoting inferior administrative organs. For construction of industrial parks, if from implementing policies, superior government should take the centralized management method on the principle of carrying a task right down to the grass-roots level. In this situation, local government becomes administrative tool of superior government. It will not only fail to bring into full play their subjective initiative, but also result in separation of industrial parks from local economy and is not favorable for mutual development. From this, centralization and decentralization conflict arises between superior and inferior government, and it forms a game relationship under the drive of power distribution of building industrial parks and competitively developing industrial parks. From self benefits, inferior government will have motive force to develop industrial parks. Under the condition of imperfect supervision and assessment mechanism, such administrative decentralization gives inferior or local government greater decision making power, which makes...
The impulse of construction of industrial parks becomes reality. Even though it may be reasonable to develop industrial parks from the perspective of a certain region, but it may not be suitable from the perspective of the whole province or whole country. Imperfect supervision and assessment mechanism leads to local government building industrial parks for their own benefits. This becomes one of reasons for surplus supply of industrial parks.

Through further analysis on assessment system of local government, we can know that the existing assessment method of local government is a low-cost total amount assessment. Under this assessment mechanism, tenure system of officials and competition of inferior government becomes major reasons for surplus supply of industrial parks. The former is because of opportunist behavior of officials. Short tenure of officials directly leads to short term of behavior of officials, and accordingly decision for building industrial parks lacks risk constraints; the latter is based on game result of prisoner’s dilemma. The power distribution of superior government for building industrial parks leads to manifestation of prisoner’s dilemma. One region builds industrial parks and another region will follow the step. Such vicious circle is like bush fire difficult to control. Interaction of these two factors promotes rapid increase in quantity of industrial parks. As a result, overall structural surplus supply occurs in enterprise cluster space carrier of industrial parks.

The Public Choice Theory based election coercion effect is another cause for surplus supply of industrial parks. The famous Hotelling model and median voter theorem indicate that superior government has "regulation coercion effect" on inferior government, but superior government is elected by local government level by level. To win support of inferior government, superior government has to keep its scheme consistent with willingness of median voters. In this situation, many inferior local governments have the election coercion effect, and they will coerce superior government not interfering in their building industrial parks. Consequently, the overall supply of industrial parks becomes out of balance.

2.2 Scale economy and government failure leading to surplus supply of industrial parks

Infrastructure construction in industrial parks needs scale economy, which becomes a reason for surplus supply of industrial parks. Industrial parks will not manifest their economic performance until they reach certain scale. From the perspective of scale economy, the optimum scale of a certain project lies in the critical point between Economies of Scale and Diseconomies of Scale. Different industrial parks have different requirements for scale, but for most industrial parks, the scale is considerably large to reach this critical point. Besides, since infrastructure construction is not movable, it is highly attached to space and region. Investment in infrastructure is sunk. Once put into use, it can not be used for other purposes. Therefore, basically, it has no residual value. Once infrastructure construction is completed, it has to be used in accordance with defined purpose. Otherwise, the huge investment will fail to be recovered. This also leads to certain precedence of investment in infrastructure. If the investment is made only for satisfying current demands, it will need greater construction capital when it needs expansion in future. As a result, it will lead to waste. At the same time, infrastructure generally has the problem of long construction cycle, thus the construction should go ahead of the rest. In the process of infrastructure construction, objectively, it should take precedence over other direct production investment, and it should properly expand scale of infrastructure construction, to satisfy future demand for economic expansion.

On the other hand, inherent drawbacks of public services undertaken by government also will lead to surplus supply of government-leading industrial parks. Government is composed of various people who pursue maximum self-benefit rather than maximum entire people benefit. Thus, there is problem of government failure. When government leads construction of industrial parks, it will focus on realization of self benefit. For example, it will build a large industrial park, to realize management and control of more social and economic affairs, and obtain benefit in economy or reputation, or realize self-satisfaction with management and control of large scale economic resources.

The above statement is a negative consideration of government act. Even if considered positively, industrial parks also have the tendency of too large scale, which is mainly resulted from optimistic expectation of limited rationality of government. For a long time, when we make economic analysis, we often take decision-makers as rational men, and believe that rational men have profound knowledge related to environment where they live, have powerful computing skills. Relying on these skills, they can accurately find out which scheme among alternative schemes can reach its highest point of their preference. However, in actual life, decision-makers generally have limited ability of rational men. Their information is not sufficient and complete, or it needs high cost to obtain sufficient and complete information. Therefore, they have to give up. In addition, their computing ability is also limited, "they are intended to become rational, but only limited goal can be realized"[4]. When developing local economy through industrial parks, such limited rationality is manifested as follows: under the drive of urgent desire and effort of the masses for developing local economy, and when dealing with a lot of public affairs, local government will have optimistic expectation about demands for industrial parks, then they will expand scale of industrial parks to suit rapid development of economy. Nevertheless, actual economic development may not be same as their expectation. Various unexpected situations may appear, and such optimistic expectation of limited rationality of economic development will bring about surplus supply of industrial parks.

2.3 Descretized industrial parks due to surplus supply of industrial parks

From the government point of view, local government generally belongs to financial shortage government. However, due to public goods nature of industrial parks, funds for construction of industrial parks are largely supplied by government. With financial shortage, local government has to obtain initial
funds through bank credit. Such indirect financing method plays a great role in early stage of development of industrial parks, greatly reduces financial burden of local government. However, it also brings huge debt burden. The larger the scale of industrial parks, the larger the credit burden it will bring. Since infrastructure within industrial parks is not movable and huge investment becomes sunk costs, under the huge debt burden brought by serious surplus supply of industrial parks, local government has to invite more enterprises to enter industrial parks. The more entering enterprises, the more financial revenues local government will obtain. Besides, local government faces problems of economic targets issued by superior government, such as economic aggregate, taxation, and employment in the region. These factors make local government care about economic aggregate. When supply of aggregate industrial parks is seriously surplus, local government has to refuse no enterprise, rather than select optimum enterprises. Cut-throat competition resulted from investment inviting activities will lead to discretized development of industrial parks. In addition, accompanying with cyclic election, government act also has political cycle. Such cycle contains a key point that act of local government is oriented towards optimizing economic targets in the cycle, to cope with economic assessment of superior government. After completion of construction of industrial parks, if it fails to attract enterprises to enter, economic targets of the government in tenure of office will be greatly influenced. If the supply of industrial parks is seriously surplus, local government has cut-throat competition with each other, and reduces such products, in other words, investment inviting activities focus on funds rather than industry. This leads to prisoner dilemma. Industrial parks only consider immediate interest, fail to control quality strictly. As a result, all enterprises are invited to industrial parks, as long as they are willing to enter, no matter whether they are suitable or not. Their development situation in future is the affair of the next government. In the situation of serious surplus of industrial parks, the opportunistic behavior of tenure of office resulted from political election cycle is one of reasons for discretized industries in industrial parks.

From the perspective of entrepreneurs, they make decisions on the basis of maximizing profit. When deciding to enter an industrial park, they not only consider efficiency growth brought by enterprise clustered industrial parks, but also care about such factors as discount of future income and policy favor. In the situation of many industrial parks failing to form enterprise cluster, enterprises as rational men naturally will not consider income generated from cluster advantages, but only take preferential policies and other favorable conditions as basis of entering industrial parks. Besides, many small and medium sized enterprises have not realized benefits of enterprise cluster, let alone take cluster advantages as decision basis. As a matter of fact, many enterprises are footloose. Once attracted by more preferential policies, they will move to these parks which bring more economic benefits and provide more preferential policies. Thus, in the situation of serious surplus of industrial parks in total and single quantity, inferior local government has to provide more preferential conditions to invite investment. Such vicious circle leads to cut-throat competition of local government for inviting investment, consequently causing discretized industries in industrial parks.

3 Agglomeration countermeasures for discretized industries in industrial parks

3.1 Scientifically distributing administrative power of local government, improving supervision and assessment mechanism, and guaranteeing reasonable supply of industrial parks from system

Scientifically distributing administrative power of local government needs properly treating relationship between centralization and decentralization. Decentralization can bring into full play subjective initiative of inferior local government and play positive role in local economy. However, in the process of decentralization, it is required to pay attention to reasonable constraint of local government, make local government not only can take full administration within the extent of authorities, but also can avoid excess of administrative authorization and out of control of power. When distributing power for construction of industrial parks to realize high-efficient resource allocation, superior government should consider equitable demand of local area for local economic development, and make proper compensation and reward for those that make great contribution to overall high-efficient allocation of resources in the manner of taxation and transfer payment, to keep industrial parks under the power distribution of superior government consistent with construction of industrial parks under self-benefit decisions of local government, ultimately to balance the industrial parks with target of power distribution of superior government.

In the decentralized power distribution of superior and inferior government, perfect supervision and assessment mechanism is the key to guarantee reasonable supply of industrial parks. The supervision and assessment of inferior government should focus on incorporation of the local economic development quality target and avoid over-stress assessment of economic aggregate. Assessment targets should also attach importance to sustainable development requirement of local economy and avoid short-term development tendency of industrial parks due to opportunistic behavior of tenure of local government. In addition, it is recommended to introduce social supervision mechanism, bring into full play supervision, constraint and propaganda functions of guilds, associations and intermediaries to development of industrial parks, reinforce punishment of industrial parks for violation of regulations, so as to keep supply of industrial parks at a reasonable level and ensure long-term and benign development of industrial parks.

3.2 Introducing market-oriented industrial park construction mechanism, to promote market-oriented supply of industrial parks

Surplus supply of industrial parks is resulted partially from self characteristic of construction of industrial parks, and especially from government decisions. As stated above, in the government supply of industrial parks, since government has motiva-
3.3 Strengthening construction of administrative ethics and influence of limited rationality on estimation of demand for industrial parks. On the one hand, it can take advantage of automatic regulation function of this invisible hand, to keep scale of industrial parks at a reasonable level. On the other hand, market-oriented industrial park construction can make government get rid of huge debt payment pressure, which is favorable for government exempting from influence of short-term economic pressure and painstakingly building enterprise clustered industrial parks from a long-term point of view. Market-oriented construction of industrial parks does not exclude positive function of government in construction of industrial parks, and there is also the problem of market failure. However, government must be aware that government function shall be brought into play in the area where market mechanism fails to work. The key of government is to recognize market failure and make rectification through public administration. Sticking to market-oriented and government-assisted guiding thought is the key to market-oriented construction of industrial parks.

3.3 Strengthening construction of administrative ethics and abilities of local government, to promote coordinated and healthy development of industrial parks Administrative ethics is an internal constraint mechanism of administrative power. It is recommended to strengthen construction of local government administrative ethics, make public administrative organ consciously put public interest above individual benefit, keep construction of industrial parks free from tangling of government, and solve surplus supply of industrial parks resulted from government failure due to economic men motivation of government.

Besides, it is proposed to reinforce construction of administrative ability of local government, which will play significant role in scientific development of industrial parks. Through improving administrative ability of local government, it is expected to raise scientific decision making level of local government, maximize influence of limited rationality on estimation of demand for industrial parks, and ensure reasonable supply of industrial parks. Scientific development of industrial parks needs stressing coordinated development between industrial parks, parent city, and between each industrial park, taking full consideration of differences between industrial parks, making clear of respective development orientation, giving priority to the development of leading industry, avoiding homogeneous competition between industrial parks, and making effort to realize differential and staggered development of industrial parks. For industrial parks remaining at different development stage in different regions, it should establish long-term cooperative mechanism, and carry out trans-regional resource consolidation, function complementation, talent interaction, and experience exchange, to promote improvement of overall development level and clustered development of industrial parks.

3.4 Forming excellent enterprise cluster development expectation and strengthening cluster - based decisions of enterprises entering industrial parks Local government should take enterprise cluster as major target of development of industrial parks and strictly implement the plan, to make whole society, especially enterprises, feel prospect and hope of clustered development of enterprises in industrial parks, so as to form desired expectation of clustered development of enterprises. In addition, government at all levels should enhance social propaganda and establish common understanding of promotion function of clustered development to enterprises and social economy in the range of whole society, to make the whole society, especially enterprises, really realize significance of entering related industrial parks and forming cluster economy to long-term competitive edge, strengthen decision of enterprises entering industrial parks, and to promote clustered development of enterprises in industrial parks.

4 Conclusions
Although industrial parks have many problems in the process of development, their achievements and functions are obvious and can not be erased. They play a significant role in optimization and upgrade of regional industries, so they are effective forms of current industrial development. Currently, in accordance with seriously surplus supply of industrial parks and discreted development of industries, the most direct and effective way is to control supply of industrial parks. Under the guidance of this thought, it is recommended to establish proper administrative power division mechanism, set up and improve political performance assessment mechanism, introduce market-oriented mechanism for construction of industrial parks, strengthen construction of administrative ethics of local government, raise administrative ability of government, and enhance decision of enterprises for entering industrial parks, to keep supply of industrial parks at a reasonable level, and ensure clustered development of enterprises entering industrial parks.

References